

# SOLVING SYSTEMS OF EQUATIONS

## SUBSTITUTION METHOD

Steps:

1. Solve one equation for one of the variables.
2. Substitute the result into the other equation.
3. Solve the resulting equation.
4. Substitute the value into either equation to find the value of the other variable.

### Practice – Step 1

Solve for y.

1)  $x + y = 1$

2)  $x - y = 1$

3)  $2x + y = -3$

4)  $5x + y = 1$

5)  $4x - y = 6$

6)  $-2x - y = 8$

Solve for x.

7)  $x + y = 4$

8)  $x - y = -2$

9)  $x + 3y = 7$

10)  $x + 8y = 0$

11)  $10y - x = 1$

12)  $-x - 4y = 3$

If you plan to solve systems using the substitution method, which equation in the pair is the better choice for Step 1?

13)  $2x - 3y = 5$   
 $x + 3y = -2$

14)  $5v + u = -17$   
 $3u = 4v + 6$

15)  $4a = 3b + 15$   
 $2b - a = 0$

Solve each system using the substitution method.

16)  $x = 3$   
 $y = x - 2$

17)  $y = x - 8$   
 $y = 4$

18)  $y = 2x + 1$   
 $x = 3$

19)  $x + 2y = 4$   
 $x - 3y = -1$

20)  $2x - y = 5$   
 $2y = 4x + 1$

21)  $2m - 3n = 6$   
 $m = 3 - 2n$

22)  $y = x$   
 $2x + 3y = 20$

23)  $3a - b = 14$   
 $a = 2b - 2$

24)  $x + y = 4$   
 $2x + 3y = 11$

25)  $2a - 3b = -11$   
 $a - b = -4$

26)  $m - 2n = -8$   
 $n + m = 4$

27)  $7x + 3y = 1$   
 $2x - y = -9$

Use the substitution method to solve each system of three equations. Express each solution as an ordered triple  $(x, y, z)$ .

28)  $x = 3$   
 $y = 2x - 1$   
 $x + y + z = 0$

29)  $x = y + 1$   
 $z = 2y$   
 $x + y + z = 9$

30)  $x = 2z + 14$   
 $y = 3z + 15$   
 $2x - 3 = 3y - z$